

T into the denominator of the second term; they evidently differ from our first equation $p = bT - a$, in which a is independent of temperature.

We shall soon be in a position to communicate the results of this investigation, giving full data.

[January 18th, 1887.—We have alluded to Clausius's formula, $p = \frac{RT}{v-\alpha} - \frac{c}{T(v+\beta)^2}$; his latest published formula is, however, $p = \frac{RT}{v-\alpha} - \frac{c}{\Theta(v+\beta)^2}$, where $\Theta = aT^n - b$. As the second term is here also a function of temperature, it is evident that his last equation is also not in accordance with the simple relation $p = bT - a$].

III. "Note on *Lepidodendron Harcourtii* and *L. fuliginosum* (Will)." By W. C. WILLIAMSON, LL.D., F.R.S., Professor of Botany in the Owens College and in the Victoria University. Received November 27, 1886.

In March, 1832, the late Mr. Witham read to the Natural History Society of Newcastle-upon-Tyne the first public notice of the classic specimen of *Lepidodendron* known as *Lepidodendron Harcourtii*. Still later (1833) he published further figures and descriptions of the same specimen in his work on 'The Internal Structure of Fossil Vegetables.' Additional figures and descriptions of the same object appeared in the second volume of Lindley and Hutton's 'Fossil Flora,' and in Brongniart's 'Végétaux Fossiles.' But notwithstanding all these publications the exact plant to which they referred has long been doubtful. I hoped to have found either the original specimen in the museum of the Yorkshire Philosophical Society or the sections described by Lindley and Hutton in that of the Newcastle Society; but, though carefully sought for, I long failed to discover either one or the other.

In 1871, I laid before the Royal Society my memoir, Part II, "On the Organisation of the Fossil Plants of the Coal-measures," in which I figured (Plate 25, fig. 12), a plant that seemed to me to be identical with *L. Harcourtii*; and in Part XI (1880) of the same series of memoirs, I gave further representations of the same plant (Plate 51, fig. 10; Plate 49, fig. 11). Since the publication of the latter memoir I have obtained a fine series of specimens, which appeared to me to approach still more closely to the various representations of *Lepidodendron Harcourtii*, referred to above, and which inclined me to think that I had hitherto included two species under a common name. The two forms unmistakably belong to a common type, to which I

have frequently had occasion to refer as "the type of *L. Harcourtii*," characterised by the possession of a very distinct parenchymatous medulla, surrounded by a sharply-defined non-exogenous vascular zone—the *Étui médullaire* of Brongniart—and by the *almost* entire absence of any exogenous vascular zone; the chief exception to the last feature being represented in the Plate 49, fig. 11, referred to above.

One of the most characteristic features seen in my new specimens occurs in the structure of the foliar bundles. These have been large, and in transverse sections of a stem they are rendered increasingly conspicuous, by the disappearance of a considerable amount of cellular tissue which originally belonged to them, but which is now only represented by a clear vacant space. What remains of these bundles is equally characteristic. In each case the bundle appears to be a double one; owing to the preservation not only of its vascular or zylem part, but also of a distinct and separate string of what has obviously been a modification of the hard bast of the phloem part of the bundle. A further feature occurs in the almost invariable disappearance of the entire inner cortical zone.

Visiting York a few weeks ago, I made a fresh search for Harcourt's original specimen, and with the kind aid of the officers of the museum I was this time successful. The specimen represented on Plate 98 (fig. 1), of the 'Fossil Flora,' vol. 2, was discovered, and by the kindness of Mr. Reed, the intelligent Honorary Curator of the geological department of this museum, I have been permitted to obtain a transverse section of it. It is now certain that my more recently acquired specimens represent the true *L. Harcourtii*, and, in all probability, fig. 9 in Plate 52 of my Part XI is a very young branch of the same species. Those previously figured by me and referred to above are certainly distinct. They are characterised by the greater uniformity in the composition of the entire cortex, the inner part of which is preserved, and by the absence of the duplex structure of the foliar bundle. The small size of the cells of the inner cortex, and the dense aspect both of it and of the foliar bundles (see fig. 10, Plate 51, Part XI), give to transverse sections of the form so sooty an aspect contrasted with the luminous semitransparency of the true *L. Harcourtii*, that I propose to recognise the former as *Lepidodendron fuliginosum*.